Space Weather Forecast

Issued on Tuesday, 09 July 2024 at 13:07 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Moderate class flares (R1-R2; Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate with a Moderate class flare from a region close to the southeast limb. There are seven sunspot regions on the disc. The largest located in the southeast, with moderate size and complexity. The remaining regions on the disc appear small and magnetically simple. Of note are two returning regions now rotating across the southeast limb. At least one region indicates moderate complexity, however confidence in classification of both regions will improve they rotate further onto the visible disc. No Earth-directed Coronal Mass Ejections (CMEs) have been observed during the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds peaked at slightly elevated levels of 438 km/s at 08/1455 UTC possibly as a result of a weak connection to the fast wind of a coronal hole in the northwest. Since then, solar winds have been on a slow decline back to Low levels at around 370 km/s. The Interplanetary Magnetic Field was largely weak. The important north-south component varied weakly throughout. The resulting geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: Solar radiation was measured at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with isolated Moderate-class flares likely and a very slight chance of activity reaching High levels from any isolated Strong flare. Flare risks will be revised as the new regions in the far southeast rotate into clearer view on the visible disc in the coming days.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs feature in the forecast. The solar wind is most likely to be at Low to slightly elevated levels on day 1 (10 Jul), owing to minor fast wind influences from a coronal hole in the northwest disc. Two moderately sized coronal holes in the southwest disc could produce elevated solar winds between days 2-4 (10-12 Jul). However, any geomagnetic response from either, or both of these two coronal holes is likely to be muted due to Earth's proximity to the solstice.
Geomagnetic activity is expected to be mainly Quiet to Unsettled through the period, but with a chance of isolated Active intervals, especially day 2 and 3 (10 and 11 Jul) due to anticipated fast wind influence.

Energetic Particles / Solar Radiation: Solar radiation storms are not expected, but there is a very slight chance of reaching S1/Minor Radiation Storm or greater levels. This risk increases a little later in the period as a sunspot, currently in the southeast, rotates towards centre disc and into a more geoeffective position.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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